

## CONNECTICUT ACUTE CARE HOSPITALS

### CASE MIX INDEX (CMI) ANALYSIS: FY 2014 – FY 2018

Case mix index (CMI) is used to determine the severity level of patients within a hospital and how much of the hospital’s resources will be utilized to care for and treat the patients. A higher CMI should indicate that a hospital is serving an unhealthier population or performs more expensive procedures than a hospital with a lower CMI, and therefore may receive higher payments. CMI was originally designed for calculating payments and is highly dependent on

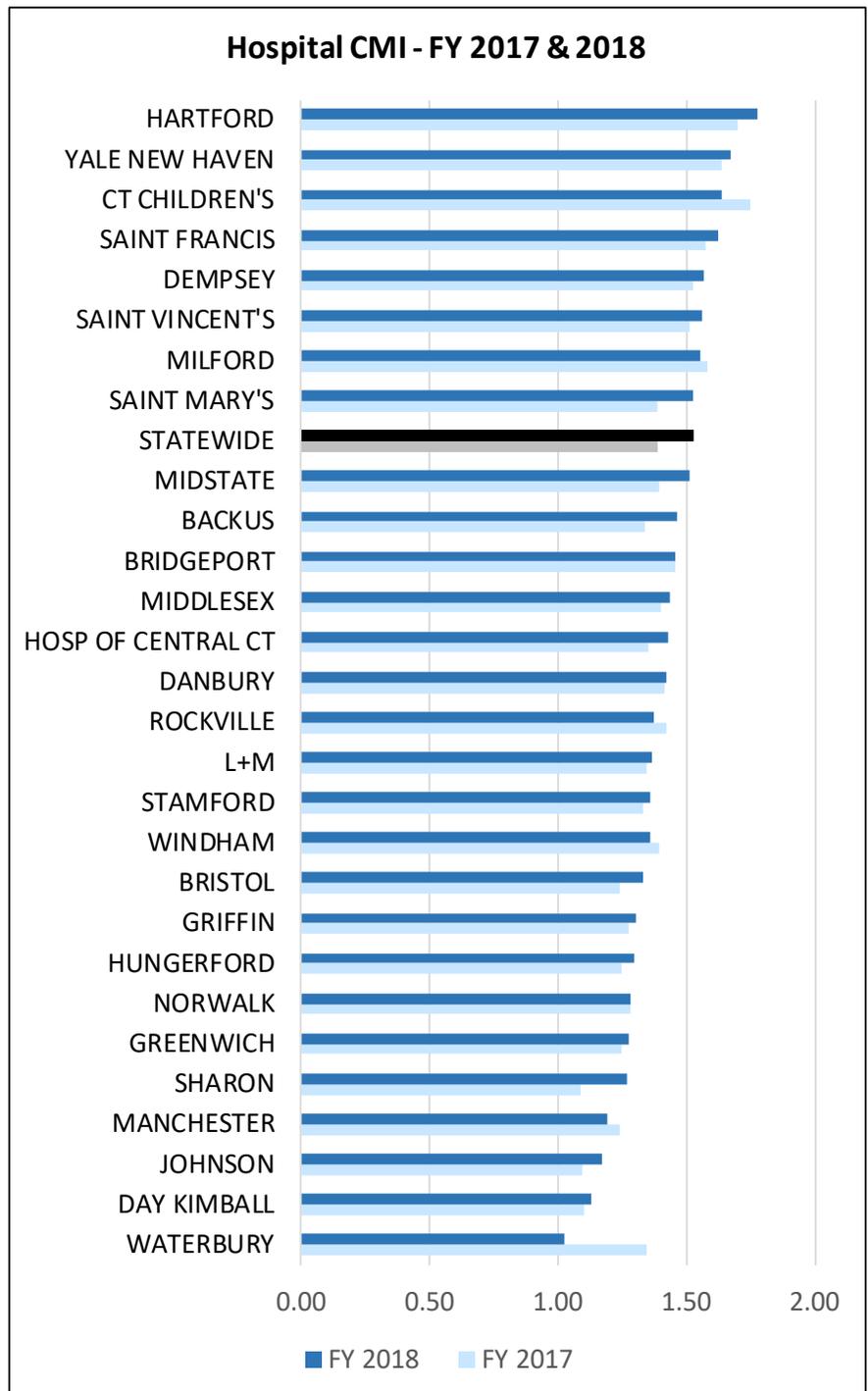
documentation and coding accuracy.

Below is an analysis of CMI data for the Connecticut (CT) acute care hospitals for Fiscal Year (FY) 2014 to FY 2018 which shows how CMI has gradually increased over the last 4 years for most hospitals.

#### 1 Year Statewide Trend

In FY 2018 the statewide CMI increased by 3% to 1.51 from 1.47 in FY 2017. CMI for hospitals ranged from 1.03 (Waterbury) to 1.77 (Hartford). Eight hospitals had a CMI higher than the statewide index. The group was predominately made up of large hospitals. The group of eight included St. Mary’s (1.53), Milford (1.56), St. Vincent’s (1.56), Dempsey (1.57), St. Francis (1.62), CT Children’s (1.64), Yale-New Haven (1.67) and Hartford (1.77).

Overall, CMI increased for most of the state’s 28 acute care hospitals, 22 or 79%, in FY 2018. The hospitals with the greatest increases were Sharon (17%) and St. Mary’s (10%). For the remaining six hospitals that showed a drop in CMI, the largest decreases were at Waterbury (-24%) and CT Children’s (-6%). There were also decreases at Manchester (-4%) and Rockville General (-3%) which along with Waterbury, are all owned by Prospect Medical; a for profit chain of hospitals based in California. The other two hospitals with a drop in CMI were Milford (-2%) and Windham (-3%).



## 4 Year Statewide Trend

Statewide CMI rose from 1.38 in FY 2014 to 1.51 in FY 2018; an increase of almost 10%. Nearly all (24) hospitals had increases in their CMI over the 4-year period, and over one-half (15) of the hospitals had increases exceeding the statewide index. Sharon (18%) and Bristol (17%) had the largest cumulative increases while Rockville General (-12%), and Waterbury (-22%) had the highest decreases. Over the four years, statewide CMI increased annually due to increases at most of the state’s hospitals.

| <b>Summary of hospital CMI changes<br/>FY 2014 - FY 2018</b> |               |                          |                                |                                |
|--|---------------|--------------------------|--------------------------------|--------------------------------|
| Fiscal Year  | Statewide CMI | % Change per year in CMI | # hospitals with CMI increases | % hospitals with CMI increases |
| FY 2014  | 1.38          | n/a                      | n/a                            | n/a                            |
| FY 2015  | 1.40          | 1.2%                     | 17                             | 60.7%                          |
| FY 2016  | 1.44          | 3.5%                     | 23                             | 82.1%                          |
| FY 2017  | 1.47          | 1.6%                     | 20                             | 71.4%                          |
| FY 2018  | 1.51          | 3.0%                     | 22                             | 78.6%                          |
| Cumulative Change<br>FY 2014 - FY 2018                       | 0.13          | 9.6%                     | 24                             | 85.7%                          |

## Factors that may Influence CMI

Provided on the next page is hospital specific CMI data, for FY 2014 and FY 2018 and factors that are likely to influence a hospital’s index. In FY 2018, CMI were higher for large hospitals (based on bed size), in urban areas and those providing more expensive complex, high-level or resource intensive services than small hospitals. Additionally, CMI were higher at hospitals serving relatively higher percentages of Medicare and Medicaid patients who tend to be more severely ill and need high level services than commercially insured patients.<sup>1,2</sup> Some hospitals in these categories had significant decreases; some outside these categories also had significant increases. This phenomenon indicates there are other critical factors that influence case mix index.

While CMI has been rising between FY 2014 and FY 2018, both patient days and discharges decreased at most hospitals during this time. Statewide patient days dropped by 42,000 (2%) with 19 hospitals having reductions. Similarly, statewide discharges fell by 8,200 (2%) with 17 hospitals experiencing a decline.

A major determinant of CMI is a hospital’s ability to correctly document and code each of its cases<sup>3</sup>. Not correctly coding patient diagnoses can have a severe impact on the hospital’s total CMI and reimbursement from payers. The higher a hospital’s CMI, the more the hospital will be reimbursed for providing care. Hospitals therefore have a monetary incentive to document and code a higher severity level of a patient’s conditions if the diagnoses can support a higher CMI. Accurately coding each procedure performed on a patient also positively affects total operating income and the profitability of the institution.

<sup>1</sup> American Hospital Association. “Are Medicare patients getting sicker?” TrendWatch December 2012. Retrieved 3/5/2020.

<https://www.aha.org/system/files/2018-06/2012-are-medicare-pts-getting-sicker-trendwatch.pdf>

<sup>2</sup> Kaiser Family Foundation. “Medicaid enrollees are sicker and more disabled than the privately-insured.” Charts and Slides. Retrieved 3/5/2020.

<https://www.kff.org/medicaid/slide/medicaid-enrollees-are-sicker-and-more-disabled-than-the-privately-insured/>

<sup>3</sup> Mendez, Carmen M et al. “Impact of hospital variables on case mix index as a marker of disease severity.” *Population health management* vol. 17,1 (2014): 28-34. doi:10.1089/pop.2013.0002 Retrieved 1/30/2020. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3931432/>

Data Sources: *Office of Health Strategy Hospital Reporting System (HRS) Report 550 and Hospital Inpatient Discharge Database (HIDD)*

For questions contact: [HSP@ct.gov](mailto:HSP@ct.gov)

For more about the Office check: <https://portal.ct.gov/OHS>

### Conclusion

OHS will continue to monitor and examine statewide and individual hospital CMI to identify why hospital CMI have been steadily rising while patient days and discharges have been declining.

| Hospital CMI and Influencing Factors              |             |             |                   |               |                  |                           |                    |                            |
|---|-------------|-------------|-------------------|---------------|------------------|---------------------------|--------------------|----------------------------|
| Hospital Name                                     | FY 2014 CMI | FY 2018 CMI | Diff 2014 to 2018 | Licensed Beds | % Govt Payer Mix | Hospital Town             | Hospital Location* | # of High level Services** |
| <b>ASCENSION HEALTH</b>                           |             |             |                   |               |                  |                           |                    |                            |
| SAINT VINCENTS                                    | 1.38        | 1.56        | 13.6%             | 520           | 56%              | Bridgeport                | Urban              | 3                          |
| <b>HARTFORD HEALTHCARE CORPORATION</b>            |             |             |                   |               |                  |                           |                    |                            |
| BACKUS  | 1.30        | 1.46        | 12.9%             | 233           | 50%              | Norwich                   | Small Urban        | 1                          |
| HARTFORD  | 1.58        | 1.77        | 12.0%             | 867           | 52%              | Hartford                  | Urban              | 4                          |
| HOSPITAL OF CENTRAL CT                            | 1.31        | 1.43        | 8.9%              | 446           | 54%              | New Britain / Southington | Urban              | 2                          |
| HUNGERFORD  | 1.25        | 1.29        | 3.3%              | 122           | 65%              | Torrington                | Small Urban        |                            |
| MIDSTATE  | 1.33        | 1.51        | 13.9%             | 156           | 51%              | Meriden                   | Urban              | 1                          |
| WINDHAM   | 1.22        | 1.36        | 10.9%             | 144           | 59%              | Willimantic               | Small Urban        |                            |
| <b>NUVANCE HEALTH</b>                             |             |             |                   |               |                  |                           |                    |                            |
| DANBURY   | 1.38        | 1.42        | 2.9%              | 456           | 45%              | Danbury / New Milford     | Urban              | 3                          |
| NORWALK   | 1.20        | 1.28        | 6.8%              | 366           | 45%              | Norwalk                   | Urban              | 3                          |
| SHARON  | 1.07        | 1.27        | 18.2%             | 94            | 59%              | Sharon                    | Small Urban        | 1                          |
| <b>PROSPECT CT, INC.</b>                          |             |             |                   |               |                  |                           |                    |                            |
| MANCHESTER  | 1.19        | 1.19        | -0.3%             | 283           | 50%              | Manchester                | Urban              | 1                          |
| ROCKVILLE   | 1.55        | 1.37        | -11.5%            | 118           | 47%              | Vernon                    | Small Urban        | 1                          |
| WATERBURY   | 1.31        | 1.03        | -21.7%            | 393           | 63%              | Waterbury                 | Urban              | 3                          |
| <b>TRINITY HEALTH OF NEW ENGLAND</b>              |             |             |                   |               |                  |                           |                    |                            |
| JOHNSON   | 1.12        | 1.17        | 4.8%              | 101           | 51%              | Stafford                  | Small Urban        | 1                          |
| SAINT FRANCIS                                     | 1.47        | 1.62        | 10.3%             | 682           | 52%              | Hartford                  | Urban              | 3                          |
| SAINT MARY'S                                      | 1.33        | 1.53        | 14.5%             | 379           | 61%              | Waterbury                 | Urban              | 3                          |
| <b>YALE-NEW HAVEN HEALTH SERVICES CORPORATION</b> |             |             |                   |               |                  |                           |                    |                            |
| BRIDGEPORT  | 1.33        | 1.46        | 9.7%              | 383           | 57%              | Bridgeport                | Urban              | 4                          |
| GREENWICH   | 1.16        | 1.27        | 9.9%              | 206           | 32%              | Greenwich                 | Urban              | 2                          |
| L+M   | 1.25        | 1.36        | 8.7%              | 308           | 54%              | New London                | Small Urban        | 2                          |
| YALE NEW HAVEN                                    | 1.51        | 1.67        | 11.1%             | 1,541         | 46%              | New Haven                 | Urban              | 4                          |
| <b>INDIVIDUAL HOSPITAL SYSTEMS</b>                |             |             |                   |               |                  |                           |                    |                            |
| BRISTOL   | 1.14        | 1.33        | 16.6%             | 154           | 61%              | Bristol                   | Urban              |                            |
| CT CHILDREN'S                                     | 1.78        | 1.64        | -8.0%             | 187           | 33%              | Hartford                  | Urban              | 3                          |
| DAY KIMBALL                                       | 1.03        | 1.13        | 8.8%              | 122           | 54%              | Putnam                    | Small Urban        | 1                          |
| DEMPSEY   | 1.46        | 1.57        | 7.2%              | 234           | 55%              | Farmington                | Small Urban        | 2                          |
| GRIFFIN   | 1.13        | 1.30        | 14.8%             | 180           | 51%              | Derby                     | Small Urban        |                            |
| MIDDLESEX   | 1.26        | 1.44        | 13.6%             | 297           | 46%              | Middletown                | Small Urban        | 1                          |
| MILFORD   | 1.41        | 1.56        | 10.3%             | 118           | 60%              | Milford                   | Urban              |                            |
| STAMFORD  | 1.25        | 1.36        | 8.9%              | 330           | 34%              | Stamford                  | Urban              | 3                          |
| STATEWIDE   | 1.38        | 1.51        | 9.6%              | 9,420         | 49%              | n/a                       | n/a                | n/a                        |

\*Hospital location is based on town population amounts from annual figures compiled by the Department of Public Health. Hospital town is classified as urban (+50,000 people) or small urban (2,500-49,999 people) as specified by the U.S. Census Bureau.

\*\*High level services include burn care, cardiac (angioplasty and open heart), stroke, transplants and trauma services indicated in the Office of Health Strategy 2018 Inventory Table 3.

Data Sources: Office of Health Strategy Hospital Reporting System (HRS) Report 550 and Hospital Inpatient Discharge Database (HIDD)

For questions contact: [HSP@ct.gov](mailto:HSP@ct.gov)

For more about the Office check: <https://portal.ct.gov/OHS>